

## SEQUENCE LISTING

<110> Saba, Julie D.  
Fyrst, Henrik

<120> SPHINGOSINE-1-PHOSPHATE LYASE POLYPEPTIDES,  
POLYNUCLEOTIDES AND MODULATING AGENTS AND  
METHODS OF USE THEREFOR

<130> 200116.402C2

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<141> 2002-01-17

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<170> FastSEQ for Windows Version 4.0

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Sequence Listing

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Thr	Glu	Pro	Glu	Ile	Ile	Ala	Pro	Val	Thr	Ala	His	Ala	Gly	Phe	Asp	
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Pro Ser Pro Asp Gly Thr Ser Ala Leu Tyr Gly Val Ala Gly Ser Val
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aaa act gct ggc gtt gca gac aaa ttg att gtg gga ttc cta gac gca 1728
Lys Thr Ala Gly Val Ala Asp Lys Leu Ile Val Gly Phe Leu Asp Ala
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Cys Tyr Lys Leu Ile Ser Asn Phe Phe Tyr Leu Leu Lys Val Tyr Gly
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Pro Val Arg Leu Ala Val Arg Thr Tyr Glu His Ser Ser Arg Arg Leu
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Phe Arg Trp Leu Leu Asp Ser Pro Phe Leu Arg Gly Thr Val Glu Lys
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Glu Val Thr Lys Val Lys Gln Ser Ile Glu Asp Glu Leu Ile Arg Ser
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Asp Ser Gln Leu Met Asn Phe Pro Gln Leu Pro Ser Asn Gly Ile Pro
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Gln Asp Asp Val Ile Glu Glu Leu Asn Lys Leu Asn Asp Leu Ile Pro
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His Thr Gln Trp Lys Glu Gly Lys Val Ser Gly Ala Val Tyr His Gly
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Gly Asp Asp Leu Ile His Leu Gln Thr Ile Ala Tyr Glu Lys Tyr Cys
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Val Ala Asn Gln Leu His Pro Asp Val Phe Pro Ala Val Arg Lys Met
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Glu Ser Glu Val Val Ser Met Val Leu Arg Met Phe Asn Ala Pro Ser
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Lys Asn Thr Ile Leu Leu Val Gly Ser Ala Pro Asn Phe Pro His Gly
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Leu Pro Leu His Val Asp Ser Cys Leu Gly Ser Phe Ile Val Ser Phe
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Met Glu Lys Ala Gly Tyr Lys Asn Leu Pro Leu Leu Asp Phe Arg Val
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Pro Gly Val Thr Ser Ile Ser Cys Asp Thr His Lys Tyr Gly Phe Ala
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Pro Lys Gly Ser Ser Val Ile Met Tyr Arg Asn Ser Asp Leu Arg Met
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Ala Thr Met Val Asn Met Gly Glu Asn Gly Tyr Ile Glu Ser Cys Gln
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Glu Ile Val Gly Ala Ala Met Lys Phe Lys Lys Tyr Ile Gln Glu Asn
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Lys Lys Gly Trp His Phe Asn Ala Leu Gln Lys Pro Val Ala Leu His
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Met Ala Phe Thr Arg Leu Ser Ala His Val Val Asp Glu Ile Cys Asp
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gtt gca aca tac gta ctc acc aat ctg aga cat atg cat tta gat gaa	144
Val Ala Thr Tyr Val Leu Thr Asn Leu Arg His Met His Leu Asp Glu	
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Lys Asp Glu Leu Glu Lys Ser Leu Arg Ile Val Asp Arg Ser Thr Glu	
85 90 95	
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Tyr Phe Thr Thr Ile Pro Ser His Ser Val Gly Arg Thr Glu Val Leu	
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Arg Leu Ala Ala Ile Tyr Asp Asp Leu Glu Gly Pro Ala Phe Leu Glu	
115 120 125	
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Gly Arg Val Ser Gly Ala Val Phe Asn Arg Glu Asp Asp Lys Asp Glu	
130 135 140	
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Leu Trp Pro Lys Leu Phe Pro Gly Val Arg Ile Met Glu Ala Glu Val	
165 170 175	
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Val Arg Met Cys Cys Asn Met Met Asn Gly Asp Ser Glu Thr Cys Gly	
180 185 190	
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Thr Met Ser Thr Gly Gly Ser Ile Ser Ile Leu Leu Ala Cys Leu Ala	
195 200 205	

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Asp Leu Val Lys Met Lys Ala Ala Ile Asn Lys Arg Thr Cys Met Leu	
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Ala Cys Leu Gly Gly Phe Leu Leu Pro Phe Leu Glu Glu Asp Glu Ile	
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Arg Tyr Asp Phe Arg Val Pro Gly Val Ser Ser Ile Ser Ala Asp Ser	
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Asp	Leu	Val	Lys	Met	Lys	Ala	Ala	Ile	Asn	Lys	Arg	Thr	Cys	Met	Leu
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Val	Gly	Ser	Ala	Pro	Asn	Phe	Pro	Phe	Gly	Thr	Val	Asp	Asp	Ile	Glu
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Ala	Ile	Gly	Gln	Leu	Gly	Leu	Glu	Tyr	Asp	Ile	Pro	Val	His	Val	Asp
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Ala	Cys	Leu	Gly	Gly	Phe	Leu	Leu	Pro	Phe	Leu	Glu	Glu	Asp	Glu	Ile
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Arg	Tyr	Asp	Phe	Arg	Val	Pro	Gly	Val	Ser	Ser	Ile	Ser	Ala	Asp	Ser
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His	Lys	Tyr	Gly	Leu	Ala	Pro	Lys	Gly	Ser	Ser	Val	Val	Leu	Tyr	Arg
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Asn	Lys	Glu	Leu	Leu	His	Asn	Gln	Tyr	Phe	Cys	Asp	Ala	Asp	Trp	Gln
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Gly	Gly	Ile	Tyr	Ala	Ser	Ala	Thr	Met	Glu	Gly	Ser	Arg	Ala	Gly	His
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Tyr	Lys	Ala	Asn	Ala	Arg	Lys	Ile	Val	Asp	Thr	Thr	Arg	Lys	Ile	Arg
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			420					425					430		
Val	Cys	Ile	Val	Ser	Trp	Thr	Thr	Asn	Asp	Gly	Val	Glu	Leu	Tyr	Arg
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Phe	His	Asn	Phe	Met	Lys	Glu	Lys	His	Trp	Gln	Leu	Asn	Gly	Leu	Gln
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 Glu Ile Leu Glu Ser Tyr Ser Thr Lys Ala Lys Asn Tyr Val Asn Gly  
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 Tyr Cys Thr Lys Tyr Glu Pro Trp Gln Leu Ile Ala Trp Ser Val Leu  
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tgt act ctg ctg ata gtc tgg gtg tat gag ctt atc ttc cag cca gag 192  
 Cys Thr Leu Leu Ile Val Trp Val Tyr Glu Leu Ile Phe Gln Pro Glu  
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 Ser Leu Trp Ser Arg Phe Lys Lys Lys Leu Phe Lys Leu Ile Arg Lys  
 65 70 75 80

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 Met Pro Phe Ile Gly Arg Lys Ile Glu Gln Gln Val Ser Lys Ala Lys  
 85 90 95

aag gat ctt gtc aag aac atg cca ttc cta aag gtg gac aag gat tat 336  
 Lys Asp Leu Val Lys Asn Met Pro Phe Leu Lys Val Asp Lys Asp Tyr  
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gtg aaa act ctg cct gct cag ggt atg ggc aca gct gag gtt ctg gag 384  
 Val Lys Thr Leu Pro Ala Gln Gly Met Gly Thr Ala Glu Val Leu Glu  
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 Arg Leu Lys Glu Tyr Ser Ser Met Asp Gly Ser Trp Gln Glu Gly Lys  
 130 135 140

gcc tca gga gct gtg tac aat ggg gaa ccg aag ctc acg gag ctg ctg 480  
 Ala Ser Gly Ala Val Tyr Asn Gly Glu Pro Lys Leu Thr Glu Leu Leu  
 145 150 155 160

gtg cag gct tat gga gaa ttc acg tgg agc aat cca ctg cat cca gat 528  
 Val Gln Ala Tyr Gly Glu Phe Thr Trp Ser Asn Pro Leu His Pro Asp  
 165 170 175

atc	ttc	cct	gga	ttg	cgg	aag	tta	gag	gca	gaa	atc	gtt	agg	atg	act	576
Ile	Phe	Pro	Gly	Leu	Arg	Lys	Leu	Glu	Ala	Glu	Ile	Val	Arg	Met	Thr	
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tgt	tcc	ctc	ttc	aat	ggg	gga	cca	gat	tcc	tgt	gga	tgt	gtg	act	tct	624
Cys	Ser	Leu	Phe	Asn	Gly	Gly	Pro	Asp	Ser	Cys	Gly	Cys	Val	Thr	Ser	
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Gly	Gly	Thr	Glu	Ser	Ile	Leu	Met	Ala	Cys	Lys	Ala	Tyr	Arg	Asp	Leu	
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Ala	Leu	Glu	Lys	Gly	Ile	Lys	Thr	Pro	Glu	Ile	Val	Ala	Pro	Glu	Ser	
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gcc	cat	gct	gca	ttc	gac	aaa	gca	gct	cat	tat	ttt	ggg	atg	aag	att	768
Ala	His	Ala	Ala	Phe	Asp	Lys	Ala	Ala	His	Tyr	Phe	Gly	Met	Lys	Ile	
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Val	Arg	Val	Ala	Leu	Lys	Lys	Asn	Met	Glu	Val	Asp	Val	Gln	Ala	Met	
			260					265					270			
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Lys	Arg	Ala	Ile	Ser	Arg	Asn	Thr	Ala	Met	Leu	Val	Cys	Ser	Thr	Pro	
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Gln	Phe	Pro	His	Gly	Val	Met	Asp	Pro	Val	Pro	Glu	Val	Ala	Lys	Leu	
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Thr	Val	Arg	Tyr	Lys	Ile	Pro	Leu	His	Val	Asp	Ala	Cys	Leu	Gly	Gly	
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Phe	Leu	Ile	Val	Phe	Met	Glu	Lys	Ala	Gly	Tyr	Pro	Leu	Glu	Lys	Pro	
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Phe	Asp	Phe	Arg	Val	Lys	Gly	Val	Thr	Ser	Ile	Ser	Ala	Asp	Thr	His	
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aag	tat	ggc	tat	gct	cct	aaa	ggt	tca	tca	gtg	gtg	atg	tac	tct	aac	1104
Lys	Tyr	Gly	Tyr	Ala	Pro	Lys	Gly	Ser	Ser	Val	Val	Met	Tyr	Ser	Asn	
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gag	aag	tac	agg	acg	tac	cag	ttc	ttt	gtt	ggt	gca	gac	tgg	caa	ggt	1152
Glu	Lys	Tyr	Arg	Thr	Tyr	Gln	Phe	Phe	Val	Gly	Ala	Asp	Trp	Gln	Gly	
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Gly Val Tyr Ala Ser Pro Ser Ile Ala Gly Ser Arg Pro Gly Gly Ile  
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 att gca gcc tgt tgg gcg gcc ttg atg cac ttc ggt gag aac ggc tat 1248  
 Ile Ala Ala Cys Trp Ala Ala Leu Met His Phe Gly Glu Asn Gly Tyr  
 405 410 415  
  
 gtt gaa gct acc aaa cag atc atc aaa act gct cgc ttc ctg aag tca 1296  
 Val Glu Ala Thr Lys Gln Ile Ile Lys Thr Ala Arg Phe Leu Lys Ser  
 420 425 430  
  
 gaa ctg gaa aac atc aaa aac atc ttc att ttc ggt gat cct caa ttg 1344  
 Glu Leu Glu Asn Ile Lys Asn Ile Phe Ile Phe Gly Asp Pro Gln Leu  
 435 440 445  
  
 tca gtt att gct ctg gga tcc aac gat ttt gac att tac cga cta tct 1392  
 Ser Val Ile Ala Leu Gly Ser Asn Asp Phe Asp Ile Tyr Arg Leu Ser  
 450 455 460  
  
 aat atg atg tct gct aag ggg tgg aat ttt aac tac ctg cag ttc cca 1440  
 Asn Met Met Ser Ala Lys Gly Trp Asn Phe Asn Tyr Leu Gln Phe Pro  
 465 470 475 480  
  
 aga agc att cat ttc tgc att acg tta gta cat act cgg aag cga gtg 1488  
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 Ala Ile Gln Phe Leu Lys Asp Ile Arg Glu Ser Val Thr Gln Ile Met  
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 Lys Asn Pro Lys Ala Lys Thr Thr Gly Met Gly Ala Ile Tyr Gly Met  
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 Ala Gln Ala Thr Ile Asp Arg Lys Leu Val Ala Glu Ile Ser Ser Val  
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 Phe Leu Asp Cys Leu Tyr Thr Thr Asp Pro Val Thr Gln Gly Asn Gln  
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 Cys Thr Leu Leu Ile Val Trp Val Tyr Glu Leu Ile Phe Gln Pro Glu  
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 Ser Leu Trp Ser Arg Phe Lys Lys Lys Leu Phe Lys Leu Ile Arg Lys  
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 Lys Asp Leu Val Lys Asn Met Pro Phe Leu Lys Val Asp Lys Asp Tyr  
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 Val Lys Thr Leu Pro Ala Gln Gly Met Gly Thr Ala Glu Val Leu Glu  
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 Arg Leu Lys Glu Tyr Ser Ser Met Asp Gly Ser Trp Gln Glu Gly Lys  
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 Ala Ser Gly Ala Val Tyr Asn Gly Glu Pro Lys Leu Thr Glu Leu Leu  
 145 150 155 160  
 Val Gln Ala Tyr Gly Glu Phe Thr Trp Ser Asn Pro Leu His Pro Asp  
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 Ile Phe Pro Gly Leu Arg Lys Leu Glu Ala Glu Ile Val Arg Met Thr  
 180 185 190  
 Cys Ser Leu Phe Asn Gly Gly Pro Asp Ser Cys Gly Cys Val Thr Ser  
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 Ala Leu Glu Lys Gly Ile Lys Thr Pro Glu Ile Val Ala Pro Glu Ser  
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 Ala His Ala Ala Phe Asp Lys Ala Ala His Tyr Phe Gly Met Lys Ile  
 245 250 255  
 Val Arg Val Ala Leu Lys Lys Asn Met Glu Val Asp Val Gln Ala Met  
 260 265 270  
 Lys Arg Ala Ile Ser Arg Asn Thr Ala Met Leu Val Cys Ser Thr Pro  
 275 280 285  
 Gln Phe Pro His Gly Val Met Asp Pro Val Pro Glu Val Ala Lys Leu  
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 Thr Val Arg Tyr Lys Ile Pro Leu His Val Asp Ala Cys Leu Gly Gly  
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 Lys Tyr Gly Tyr Ala Pro Lys Gly Ser Ser Val Val Met Tyr Ser Asn  
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 Glu Lys Tyr Arg Thr Tyr Gln Phe Phe Val Gly Ala Asp Trp Gln Gly  
 370 375 380  
 Gly Val Tyr Ala Ser Pro Ser Ile Ala Gly Ser Arg Pro Gly Gly Ile  
 385 390 395 400  
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 Val Glu Ala Thr Lys Gln Ile Ile Lys Thr Ala Arg Phe Leu Lys Ser  
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Glu Leu Glu Asn Ile Lys Asn Ile Phe Ile Phe Gly Asp Pro Gln Leu  
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 465                          470                          475          480  
 Arg Ser Ile His Phe Cys Ile Thr Leu Val His Thr Arg Lys Arg Val  
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 Ala Ile Gln Phe Leu Lys Asp Ile Arg Glu Ser Val Thr Gln Ile Met  
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 Lys Asn Pro Lys Ala Lys Thr Thr Gly Met Gly Ala Ile Tyr Gly Met  
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 Ala Gln Ala Thr Ile Asp Arg Lys Leu Val Ala Glu Ile Ser Ser Val  
                           530                          535          540  
 Phe Leu Asp Cys Leu Tyr Thr Thr Asp Pro Val Thr Gln Gly Asn Gln  
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Glu Ile Leu Glu Val Tyr Ser Thr Lys Ala Lys Asn Tyr Val Asn Gly	
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 cat tgc acc aag tat gag ccc tgg cag cta att gca tgg agt gtc gtg	144
His Cys Thr Lys Tyr Glu Pro Trp Gln Leu Ile Ala Trp Ser Val Val	
35                          40                          45	
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Trp Thr Leu Leu Ile Val Trp Gly Tyr Glu Phe Val Phe Gln Pro Glu	
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Ser Leu Trp Ser Arg Phe Lys Lys Lys Cys Phe Lys Leu Thr Arg Lys	
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 atg ccc att att ggt cgt aag att caa gac aag ttg aac aag acc aag	288
Met Pro Ile Ile Gly Arg Lys Ile Gln Asp Lys Leu Asn Lys Thr Lys	
85                          90                          95	



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Phe Asp Phe Arg Val Lys Gly Val Thr Ser Ile Ser Ala Asp Thr His							
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aag tat ggc tat gcc cca aaa ggc tca tca ttg gtg ttg tat agt gac	1104						
Lys Tyr Gly Tyr Ala Pro Lys Gly Ser Ser Leu Val Leu Tyr Ser Asp							
		355		360		365	
aag aag tac agg aac tat cag ttc ttc gtc gat aca gat tgg cag ggt	1152						
Lys Lys Tyr Arg Asn Tyr Gln Phe Phe Val Asp Thr Asp Trp Gln Gly							
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ggc atc tat gct tcc cca acc atc gca ggc tca cgg cct ggt ggc att	1200						
Gly Ile Tyr Ala Ser Pro Thr Ile Ala Gly Ser Arg Pro Gly Gly Ile							
		385		390		395	
agc gca gcc tgt tgg gct gcc ttg atg cac ttc ggt gag aac ggc tat	1248						
Ser Ala Ala Cys Trp Ala Ala Leu Met His Phe Gly Glu Asn Gly Tyr							
		405		410		415	
gtt gaa gct acc aaa cag atc atc aaa act gct cgc ttc ctc aag tca	1296						
Val Glu Ala Thr Lys Gln Ile Ile Lys Thr Ala Arg Phe Leu Lys Ser							
		420		425		430	
gaa ctg gaa aat atc aaa ggc atc ttt gtt ttt ggg aat ccc caa ttg	1344						
Glu Leu Glu Asn Ile Lys Gly Ile Phe Val Phe Gly Asn Pro Gln Leu							
		435		440		445	
tca ctc att gct ctg gga tcc cgt gat ttt gac atc tac cga cta tca	1392						
Ser Leu Ile Ala Leu Gly Ser Arg Asp Phe Asp Ile Tyr Arg Leu Ser							
		450		455		460	
aac ctg atg act gct aag ggg tgg aac ttg aac cag ttg cag ttc cca	1440						
Asn Leu Met Thr Ala Lys Gly Trp Asn Leu Asn Gln Leu Gln Phe Pro							
		465		470		475	
ccc agt att cat ttc tgc atc aca tta cta cac gcc cgg aaa cga gta	1488						
Pro Ser Ile His Phe Cys Ile Thr Leu Leu His Ala Arg Lys Arg Val							
		485		490		495	
gct ata caa ttc cta aag gac att cga gaa tct gtc act caa atc atg	1536						
Ala Ile Gln Phe Leu Lys Asp Ile Arg Glu Ser Val Thr Gln Ile Met							
		500		505		510	
aag aat cct aaa gcg aag acc aca gga atg ggt gcc atc tat gcc atg	1584						
Lys Asn Pro Lys Ala Lys Thr Thr Gly Met Gly Ala Ile Tyr Ala Met							
		515		520		525	



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Ala Gln Thr Thr Val Asp Arg Asn Met Val Ala Glu Leu Ser Ser Val
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ttc ttg gac agc ttg tac agc acc gac act gtc acc cag ggc agc cag 1680
Phe Leu Asp Ser Leu Tyr Ser Thr Asp Thr Val Thr Gln Gly Ser Gln
545                      550                      555                      560

atg aat ggt tct cca aaa ccc cac tga 1707
Met Asn Gly Ser Pro Lys Pro His *
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His Cys Thr Lys Tyr Glu Pro Trp Gln Leu Ile Ala Trp Ser Val Val
      35      40      45
Trp Thr Leu Leu Ile Val Trp Gly Tyr Glu Phe Val Phe Gln Pro Glu
      50      55      60
Ser Leu Trp Ser Arg Phe Lys Lys Lys Cys Phe Lys Leu Thr Arg Lys
      65      70      75      80
Met Pro Ile Ile Gly Arg Lys Ile Gln Asp Lys Leu Asn Lys Thr Lys
      85      90      95
Asp Asp Ile Ser Lys Asn Met Ser Phe Leu Lys Val Asp Lys Glu Tyr
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Val Lys Ala Leu Pro Ser Gln Gly Leu Ser Ser Ser Ala Val Leu Glu
      115     120     125
Lys Leu Lys Glu Tyr Ser Ser Met Asp Ala Phe Trp Gln Glu Gly Arg
      130     135     140
Ala Ser Gly Thr Val Tyr Ser Gly Glu Glu Lys Leu Thr Glu Leu Leu
      145     150     155     160
Val Lys Ala Tyr Gly Asp Phe Ala Trp Ser Asn Pro Leu His Pro Asp
      165     170     175
Ile Phe Pro Gly Leu Arg Lys Ile Glu Ala Glu Ile Val Arg Ile Ala
      180     185     190
Cys Ser Leu Phe Asn Gly Gly Pro Asp Ser Cys Gly Cys Val Thr Ser
      195     200     205
Gly Gly Thr Glu Ser Ile Leu Met Ala Cys Lys Ala Cys Arg Asp Leu
      210     215     220
Ala Phe Glu Lys Gly Ile Lys Thr Pro Glu Ile Val Ala Pro Gln Ser
      225     230     235     240
Ala His Ala Ala Phe Asn Lys Ala Ala Ser Tyr Phe Gly Met Lys Ile
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Val Arg Val Pro Leu Thr Lys Met Met Glu Val Asp Val Arg Ala Met
      260     265     270
Arg Arg Ala Ile Ser Arg Asn Thr Ala Met Leu Val Cys Ser Thr Pro

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 305 310 315 320  
 Phe Leu Ile Val Phe Met Glu Lys Ala Gly Tyr Pro Leu Glu His Pro  
 325 330 335  
 Phe Asp Phe Arg Val Lys Gly Val Thr Ser Ile Ser Ala Asp Thr His  
 340 345 350  
 Lys Tyr Gly Tyr Ala Pro Lys Gly Ser Ser Leu Val Leu Tyr Ser Asp  
 355 360 365  
 Lys Lys Tyr Arg Asn Tyr Gln Phe Phe Val Asp Thr Asp Trp Gln Gly  
 370 375 380  
 Gly Ile Tyr Ala Ser Pro Thr Ile Ala Gly Ser Arg Pro Gly Gly Ile  
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 Ser Ala Ala Cys Trp Ala Ala Leu Met His Phe Gly Glu Asn Gly Tyr  
 405 410 415  
 Val Glu Ala Thr Lys Gln Ile Ile Lys Thr Ala Arg Phe Leu Lys Ser  
 420 425 430  
 Glu Leu Glu Asn Ile Lys Gly Ile Phe Val Phe Gly Asn Pro Gln Leu  
 435 440 445  
 Ser Leu Ile Ala Leu Gly Ser Arg Asp Phe Asp Ile Tyr Arg Leu Ser  
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 Asn Leu Met Thr Ala Lys Gly Trp Asn Leu Asn Gln Leu Gln Phe Pro  
 465 470 475 480  
 Pro Ser Ile His Phe Cys Ile Thr Leu Leu His Ala Arg Lys Arg Val  
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 Ala Ile Gln Phe Leu Lys Asp Ile Arg Glu Ser Val Thr Gln Ile Met  
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 Lys Asn Pro Lys Ala Lys Thr Thr Gly Met Gly Ala Ile Tyr Ala Met  
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Glu Ile Leu Glu Val Tyr Ser Thr Lys Ala Lys Asn Tyr Val Asn Gly  
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 His Cys Thr Lys Tyr Glu Pro Trp Gln Leu Ile Ala Trp Ser Val Val  
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 Trp Thr Leu Leu Ile Val Trp Gly Tyr Glu Phe Val Phe Gln Pro Glu  
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 Ser Leu Trp Ser Arg Phe Lys Lys Lys Cys Phe Lys Leu Thr Arg Lys  
 65 70 75 80  
 atg ccc att att ggt cgt aag att caa gac aag ttg aac aag acc aag 288  
 Met Pro Ile Ile Gly Arg Lys Ile Gln Asp Lys Leu Asn Lys Thr Lys  
 85 90 95  
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 Asp Asp Ile Ser Lys Asn Met Ser Phe Leu Lys Val Asp Lys Glu Tyr  
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 gtg aaa gct tta ccc tcc cag ggt ctg agc tca tct gct gtt ttg gag 384  
 Val Lys Ala Leu Pro Ser Gln Gly Leu Ser Ser Ser Ala Val Leu Glu  
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 aaa ctt aag gag tac agc tct atg gac gcc ttc tgg caa gag ggg aga 432  
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 130 135 140  
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Met	Pro	Ile	Ile	Gly	Arg	Lys	Ile	Gln	Asp	Lys	Leu	Asn	Lys	Thr	Lys
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Asp	Asp	Ile	Ser	Lys	Asn	Met	Ser	Phe	Leu	Lys	Val	Asp	Lys	Glu	Tyr
			100					105					110		
Val	Lys	Ala	Leu	Pro	Ser	Gln	Gly	Leu	Ser	Ser	Ser	Ala	Val	Leu	Glu
		115					120					125			
Lys	Leu	Lys	Glu	Tyr	Ser	Ser	Met	Asp	Ala	Phe	Trp	Gln	Glu	Gly	Arg
	130					135					140				
Ala	Ser	Gly	Thr	Val	Tyr	Ser	Gly	Glu	Glu	Lys	Leu	Thr	Glu	Leu	Leu
145				150						155				160	
Val	Lys	Ala	Tyr	Gly	Asp	Phe	Ala	Trp	Ser	Asn	Pro	Leu	His	Pro	Asp
				165					170					175	
Ile	Phe	Pro	Gly	Leu	Arg	Lys	Ile	Glu	Ala	Glu	Ile	Val	Arg	Ile	Ala
			180					185					190		



<400> 19  
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Trp His His Thr Ile Arg Lys His Lys Arg Gly Asn Gly Ser Ser Ser  
20 25 30  
Pro Ala Asp Cys Gly Lys Gln Leu Leu Ile Leu Leu Asn Pro Lys Ser  
35 40 45  
Gly Ser Gly Lys Gly Arg Glu Leu Phe Gln Lys Gln Val Ala Pro Leu  
50 55 60  
Leu Thr Glu Ala Glu Val Gln Tyr Asp Leu Gln Ile Thr Thr His Pro  
65 70 75 80  
Gln Tyr Ala Lys Glu Phe Val Arg Thr Arg Arg Asp Leu Leu Thr Arg  
85 90 95  
Tyr Ser Gly Ile Val Val Ala Ser Gly Asp Gly Leu Phe Tyr Glu Val  
100 105 110  
Leu Asn Gly Leu Met Glu Arg Met Asp Trp Arg Arg Ala Cys Arg Glu  
115 120 125  
Leu Pro Leu Gly Ile Ile Pro Cys Gly Ser Gly Asn Gly Leu Ala Lys  
130 135 140  
Ser Val Ala His His Cys Asn Glu Pro Tyr Glu Pro Lys Pro Ile Leu  
145 150 155 160  
His Ala Thr Leu Thr Cys Met Ala Gly Lys Ser Thr Pro Met Asp Val  
165 170 175  
Val Arg Val Glu Leu Ala Thr Arg Asp Lys His Phe Val Met Tyr Ser  
180 185 190  
Phe Leu Ser Val Gly Trp Gly Leu Ile Ala Asp Ile Asp Ile Glu Ser  
195 200 205  
Glu Arg Leu Arg Ser Ile Gly Ala Gln Arg Phe Thr Leu Trp Ala Ile  
210 215 220  
Lys Arg Leu Ile Gly Leu Arg Ser Tyr Lys Gly Arg Val Ser Tyr Leu  
225 230 235 240  
Leu Gly Lys Gly Lys Lys Glu Pro Pro Val Glu Ala Ala Arg Glu Leu  
245 250 255  
Pro Ala Glu Ser Thr Ala Ala Gly Ile Arg Ser Ser Leu Pro Leu Asn  
260 265 270  
Ala Gly Glu Phe His Asp Leu Pro Glu Glu Glu Glu Gly Glu Ala Val  
275 280 285  
Leu Asp Gly Glu Gln Phe Ala Asp Ala Ile Ser Leu Asp Arg Ser Val  
290 295 300  
Tyr Arg Gln His Ala Asp Ser Trp His Ser Ala Met Ser Arg Arg Thr  
305 310 315 320  
Ala Tyr Tyr Ser Leu Gly Gly Pro Ser Met Arg Ser Asn Arg Ser Arg  
325 330 335  
Met Ser Ile Ser Gln Arg Ile Glu Ala Ala Asn Ala Glu Phe Ala Glu  
340 345 350  
Arg Val Pro Thr Gly Thr Ile Pro Pro Leu Gln Met Pro Leu Leu Ser  
355 360 365  
Ser Asp Gly Trp Ile Cys Glu Asp Gly Asp Phe Val Met Val His Ala  
370 375 380  
Ala Tyr Thr Thr His Leu Ser Ser Asp Val Phe Phe Ala Pro Glu Ser  
385 390 395 400  
Arg Leu Asp Asp Gly Leu Ile Tyr Leu Val Ile Ile Arg Arg Gly Val  
405 410 415



Ser Arg His Gln Leu Leu Asn Phe Met Leu Asn Leu Asn Ala Gly Thr  
 420 425 430  
 His Leu Pro Ile Gly Glu Asp Pro Phe Ile Lys Val Val Pro Cys Arg  
 435 440 445  
 Ala Phe Arg Ile Glu Pro Ser Ser Asp Gly Ile Leu Val Val Asp  
 450 455 460  
 Gly Glu Arg Val Glu Tyr Gly Pro Ile Gln Ala Glu Val Met Pro Gly  
 465 470 475 480  
 Leu Ile Asn Val Met Thr Thr Ser Gly Gln  
 485 490

<210> 20

<211> 524

<212> PRT

<213> Drosophila melanogaster

<400> 20

Phe Arg Ser Phe Asp Thr Phe Glu Asp Asn Met Arg Glu Ala Asp Arg  
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 Trp Tyr Arg Ser Leu Arg Trp Gln Leu His Arg Thr Leu Glu Glu Ile  
 20 25 30  
 Phe Val Ala Pro Thr Val Asp Glu Arg Arg Arg Val Leu Val Leu  
 35 40 45  
 Leu Asn Pro Lys Ser Gly Ser Gly Asp Ala Arg Glu Val Phe Asn Met  
 50 55 60  
 His Val Thr Pro Val Leu Asn Glu Ala Glu Val Pro Tyr Asp Leu Tyr  
 65 70 75 80  
 Val Thr Lys His Ser Asn Phe Ala Ile Glu Phe Leu Ser Thr Arg Cys  
 85 90 95  
 Leu Asp Ala Trp Cys Cys Val Val Ala Val Gly Gly Asp Gly Leu Phe  
 100 105 110  
 His Glu Ile Val Asn Gly Leu Leu Gln Arg Gln Asp Trp Ala His Val  
 115 120 125  
 Leu Pro His Leu Ala Leu Gly Ile Ile Pro Cys Gly Ser Gly Asn Gly  
 130 135 140  
 Leu Ala Arg Ser Ile Ala His Cys Tyr Asn Lys Pro Val Leu Gly Ala  
 145 150 155 160  
 Ala Leu Thr Val Ile Ser Gly Arg Ser Ser Pro Met Asp Val Val Arg  
 165 170 175  
 Val Gln Leu Gln Ser Arg Ser Leu Tyr Ser Phe Leu Ser Ile Gly Trp  
 180 185 190  
 Gly Leu Ile Ser Asp Val Asp Ile Glu Ser Glu Arg Ile Arg Met Leu  
 195 200 205  
 Gly Tyr Gln Arg Phe Thr Val Trp Thr Leu Tyr Arg Leu Val Asn Leu  
 210 215 220  
 Arg Thr Tyr Asn Gly Arg Ile Ser Tyr Leu Leu Thr Asp His Glu Val  
 225 230 235 240  
 Ser Ser Thr His Ser Ala Thr Gly Tyr Ala Ala Gln Arg Arg Met Gln  
 245 250 255  
 Ser Ser Arg Ser Cys Asn Thr His Ile Asp Met Leu Asn Gly Pro Ala  
 260 265 270  
 Pro Ile Tyr His Ser Ser Ala Glu Tyr Leu Pro Gln Glu Phe Ala Asp  
 275 280 285

Val Ile Ser Leu Glu Thr Ser Ile Asn Gln Ser Phe Arg Ser Arg Cys  
 290 295 300  
 Asp Ser Trp Leu Ser Gly Gly Ser Arg Arg Ser Phe Tyr Tyr Ser Ile  
 305 310 315 320  
 Ser Glu Ser Ile Tyr His Ser Leu Ala Asp Glu Ser Glu Phe Ala Gly  
 325 330 335  
 Leu Ala Ala Ala Ser Leu Glu Asn Arg Gln Gln Asn Tyr Gly Pro Ala  
 340 345 350  
 Ser Glu Leu Pro Asp Leu Asn Glu Pro Leu Ser Glu Asp Gln Gly Trp  
 355 360 365  
 Leu Val Glu Glu Gly Glu Phe Val Met Met His Ala Val Tyr Gln Thr  
 370 375 380  
 His Leu Gly Ile Asp Cys His Phe Ala Pro Lys Ala Gln Leu Asn Asp  
 385 390 395 400  
 Gly Thr Ile Tyr Leu Ile Leu Ile Arg Ala Gly Ile Ser Arg Pro His  
 405 410 415  
 Leu Leu Ser Phe Leu Tyr Asn Met Ser Ser Gly Thr His Leu Pro Glu  
 420 425 430  
 Ser His Asp Asp His Val Lys Val Leu Pro Val Arg Ala Phe Arg Leu  
 435 440 445  
 Glu Pro Tyr Asp Asn His Gly Ile Ile Thr Val Asp Gly Glu Arg Val  
 450 455 460  
 Glu Phe Gly Pro Leu Gln Ala Glu Val Leu Pro Gly Ile Ala Arg Val  
 465 470 475 480  
 Met Val Pro Asn Val Ser Thr Phe Arg Phe Gln Ser Ala Thr Leu Gln  
 485 490 495  
 His Gly Ile Pro Val Cys Ile Pro Val Arg Lys Arg Phe Val Leu Tyr  
 500 505 510  
 Asn Met Ser Ser Glu Glu Leu Ala Pro Ile Asn Glu  
 515 520

<210> 21  
 <211> 368  
 <212> PRT  
 <213> Homo sapiens

<400> 21  
 Val Leu Val Leu Leu Asn Pro Arg Gly Gly Lys Gly Lys Ala Leu Gln  
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 Leu Phe Arg Ser His Val Gln Pro Leu Leu Ala Glu Ala Glu Ile Ser  
 20 25 30  
 Phe Thr Leu Met Leu Thr Glu Arg Arg Asn His Ala Arg Glu Leu Val  
 35 40 45  
 Arg Ser Glu Glu Leu Gly Arg Trp Asp Ala Leu Val Val Met Ser Gly  
 50 55 60  
 Asp Gly Leu Met His Glu Val Val Asn Gly Leu Met Glu Arg Pro Asp  
 65 70 75 80  
 Trp Glu Thr Ala Ile Gln Lys Pro Leu Cys Ser Leu Pro Ala Gly Ser  
 85 90 95  
 Gly Asn Ala Leu Ala Ala Ser Leu Asn His Tyr Ala Gly Tyr Glu Gln  
 100 105 110  
 Val Thr Asn Glu Asp Leu Leu Thr Asn Cys Thr Leu Leu Leu Cys Arg  
 115 120 125

Arg	Leu	Leu	Ser	Pro	Met	Asn	Leu	Leu	Ser	Leu	His	Thr	Ala	Ser	Gly
130						135					140				
Leu	Arg	Leu	Phe	Ser	Val	Leu	Ser	Leu	Ala	Trp	Gly	Phe	Ile	Ala	Asp
145					150					155					160
Val	Asp	Leu	Glu	Ser	Glu	Lys	Tyr	Arg	Arg	Leu	Gly	Glu	Met	Arg	Phe
				165					170					175	
Thr	Leu	Gly	Thr	Phe	Leu	Arg	Leu	Ala	Ala	Leu	Arg	Thr	Tyr	Arg	Gly
			180					185					190		
Arg	Leu	Ala	Tyr	Leu	Pro	Val	Gly	Arg	Val	Gly	Ser	Lys	Thr	Pro	Ala
	195						200					205			
Ser	Pro	Val	Val	Val	Gln	Gln	Gly	Pro	Val	Asp	Ala	His	Leu	Val	Pro
	210					215					220				
Leu	Glu	Glu	Pro	Val	Pro	Ser	His	Trp	Thr	Val	Val	Pro	Asp	Glu	Asp
225					230					235					240
Phe	Val	Leu	Val	Leu	Ala	Leu	Leu	His	Ser	His	Leu	Gly	Ser	Glu	Met
				245					250					255	
Phe	Ala	Ala	Pro	Met	Gly	Arg	Cys	Ala	Ala	Gly	Val	Met	His	Leu	Phe
			260					265					270		
Tyr	Val	Arg	Ala	Gly	Val	Ser	Arg	Ala	Met	Leu	Leu	Arg	Leu	Phe	Leu
	275						280					285			
Ala	Met	Glu	Lys	Gly	Arg	His	Met	Glu	Tyr	Glu	Cys	Pro	Tyr	Leu	Val
	290					295					300				
Tyr	Val	Pro	Val	Val	Ala	Phe	Arg	Leu	Glu	Pro	Lys	Asp	Gly	Lys	Gly
305					310					315					320
Val	Phe	Ala	Val	Asp	Gly	Glu	Leu	Met	Val	Ser	Glu	Ala	Val	Gln	Gly
				325					330					335	
Gln	Val	His	Pro	Asn	Tyr	Phe	Trp	Met	Val	Ser	Gly	Cys	Val	Glu	Pro
			340					345					350		
Pro	Pro	Ser	Trp	Lys	Pro	Gln	Gln	Met	Pro	Pro	Pro	Glu	Glu	Pro	Leu
		355					360					365			

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